Catalogue of American Amphibians and Reptiles.

Kaiser, H., R. Boistel, and M. Breuil. 2004. *Eleutherodactylus barlagnei*.

Eleutherodactylus barlagnei Lynch

Barlagne's Piping Frog, Stream Robber Frog, Hylode ou Éleuthérodactyle de Barlagne, Guadeloupe Stream Eleuth

Eleutherodactylus barlagnei Lynch 1965:2. Type-locality: "Matouba, La Guadeloupe, ca. 700 meters elevation." Holotype, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts (MCZ) 35334, an adult female, collected by Patrice Barlagne and James Lazell, Jr. on 17 August 1961 (examined by HK).

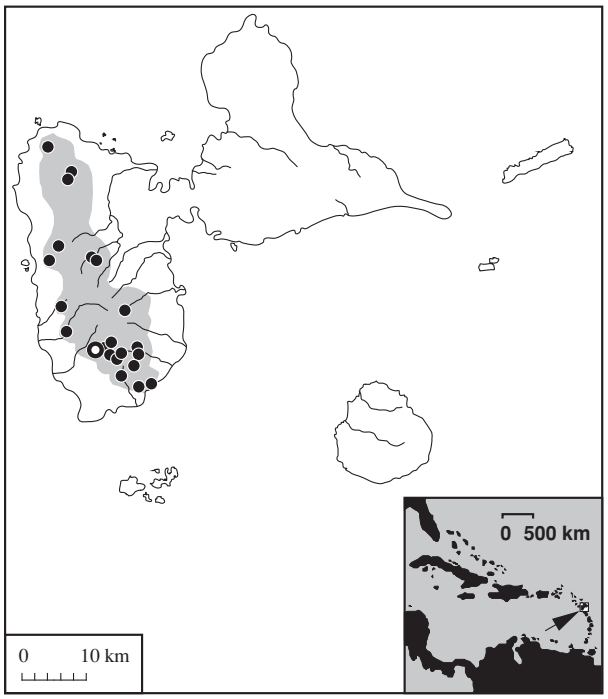
• **CONTENT.** The species is monotypic.

• **DEFINITION.** This small species of *Eleutherodactylus* (SVL of males to 23 mm, of females to 32 mm) was placed in the *E. auriculatus* group by Schwartz (1967, 1969). It is the sister species of *E. pinchoni*, according to Kaiser (1996). Dorsal coloration consists of varying shades of black or dark brown with variable speckling. A dark interocular bar is usually present, often followed by a dark truncated triangle with apex pointed posteriorly. Individuals may possess dorsal patterns with a combination of one or more of the following: one or two broad dorsal chevrons, a pair of reddish dorsolateral lines, or a single broad crural crossbar not conspicuously outlined by a pale line. Detailed descriptions of pattern variation were given by Schwartz (1967). Toes are faintly webbed, with clearly visible webbing between Toes III and IV that reaches halfway to the tip of Toe III (Lynch 1965, Schwartz 1967). Considerable individual variation in webbing exists, and, although this character is of great practical value, it should not be the only one used to derive an identification. Lateral dermal flanges on toes extend to the discs (Schwartz 1967).

• **DIAGNOSIS.** This species of *Eleutherodactylus* can be distinguished from all other members of the genus by the following characteristics: medium length hindlimbs (tibia $\bar{x}$ = 46.1 ± 3.9% SVL, both sexes combined); moderate head width (head width $\bar{x}$ = 38.2 ± 2.2% SVL, both sexes combined); webbing between Toes III and IV; tympanum hidden dorsally, with a small tubercle at its dorsalmost point (Lynch 1965); venter dark shades of greenish brown in life, often overlaid with darker brown; groin, venter, and concealed surfaces of the hindlimbs without reddish coloration; and inguinal glands absent.

Eleutherodactylus barlagnei occurs syntopically with *E. martinicensis*, *E. johnstonei*, and *E. pinchoni*. Adult *E. barlagnei* can be distinguished from the other three species by the webbing between Toes III and IV, the more warty, darkly-colored dorsum, and by the rapidly ticking vocalizations.

• **DESCRIPTIONS.** Lazell (1976) detailed his discovery of the species during a racoon hunt. In the original species description, Lynch (1965) provided a detailed holotype description, a diagnosis, and a description of color in alcohol. He also conducted a comparison of head width and head width:SVL ratios and provided a graph illustrating how *E. barlagnei* could be differentiated from *E. martinicensis*. Schwartz (1967) enumerated morphological characteristics of *E barlagnei* and compared the species with the other Guadeloupéen congeners. He also discussed in depth the color pattern and structural features of *E. barlagnei*.



MAP. Distribution of *Eleutherodactylus barlagnei*; the circle marks the type locality and dots denote other records (adapted from Breuil 2002).

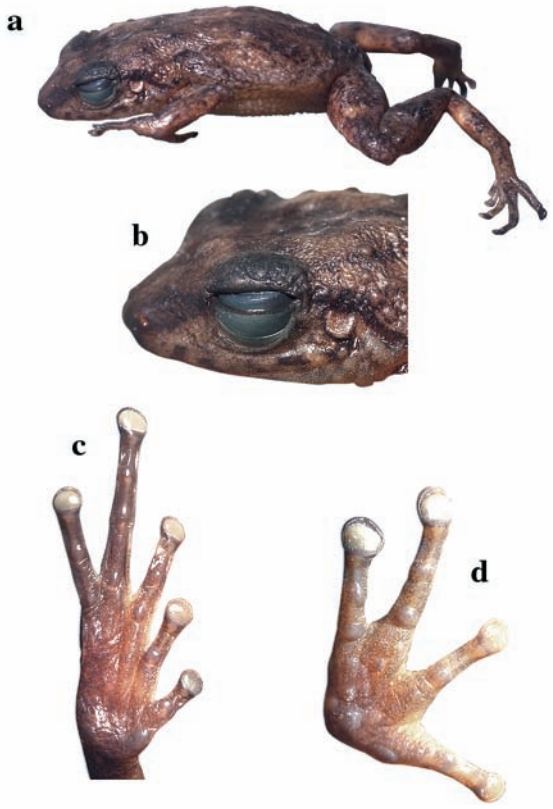


FIGURE. A specimen of *Eleutherodactylus barlagnei* (SVL = 21 mm) from Rivière Grand Carbet (a); view of the head, length = 9.5 mm (b); left foot, length = 10 mm (c); and left hand, length = 6 mm (d) (photographs by R. Boistel).

A basic species account of *E. barlagnei*, including descriptive information and some natural history data, is in Schwartz and Henderson (1991); a more comprehensive overview is in Breuil (2002).

The species was placed into the *E. auriculatus* section, *E. martinicensis* series, and *E. martinicensis* group by Hedges (1989).

Hardy (1985) described the call as comprising two notes but Kaiser et al. (1994a) consider the call uni- or biphasic with clicks. Schwartz and Henderson (1991) describe the call as a series of four or more trilled notes, descending towards the end.

• **ILLUSTRATIONS.** Lynch (1965) used line drawings to illustrate the lateral aspect of the head and the roof of the mouth in relation to *E. martinicensis*, and he presented a drawing of the right ilium for *E. barlagnei* and *E. martinicensis*. Schwartz (1967) included a drawing and a distribution map. Schwartz and Henderson (1991) and Breuil (2002) also provided distribution maps, and Breuil (2001, 2002) presented color photographs of the species. Kaiser and Henderson (1994) presented a black and white photograph. Hardy (1985) displayed an electropherogram of leg muscle proteins of *E. barlagnei*.

• **DISTRIBUTION.** Kaiser (1997) reported that the range of *E. johnstonei* on the Basse-Terre portion of Guadeloupe approaches the habitat of the single-island endemics *E. pinchoni* and *E. barlagnei*, a report verified by Breuil (2002). Reports of elevational distribution for *E. barlagnei* are in Schwartz and Thomas (1975), Schwartz and Henderson (1988), Frost (1985), Hedges and Thomas (1989), and the specimen list in Kaiser et al. (1994a). The most recent elevational information can be found in Breuil (2002), who confirmed the maximum elevation of 1281 m of Hedges (1999). Kaiser and Henderson (1994) and Breuil (2002) gave descriptions of the species' distribution and habitat.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Lescure (1987) listed *E. barlagnei* as part of his central Lesser Antillean endemism group. Kaiser (1995, 1996) discussed the use of external morphology, osteology, multivariate morphometrics, allozymes polymorphisms, and chromosomes as a means to further improve the resolution and accuracy of phylogenetic hypotheses regarding the relationships of *E. barlagnei* and its closest relatives. Hardy (1984) described the egg tooth. Kaiser and Henderson (1994) listed conservation issues related to the species and provided the location of the species' only known egg-deposition site. Kaiser et al. (1994b) conducted a phenetic and cladistic analysis that supported a sister-group relationship of *E. barlagnei* and *E. pinchoni*. Those authors also provided information regarding allozyme frequencies, showed a phenogram and a cladogram, and provided a biogeographical history for the species. Kaiser (1996) depicted a majority-rule consensus trees and a UPGMA phenogram of Mahalanobis distances for Lesser Antillean *Eleutherodactylus*, including *E. barlagnei*. Kaiser et al. (1994a) showed phylogenic trees and phylogram of West Indian *Eleutherodactylus*. Breuil (2002) proposed a speciation model for the origin of *E. pinchoni* and *E. barlagnei* based on the geological history of Basse-Terre. Schwartz and Henderson (1985) provided a key to Lesser Antillean *Eleutherodactyulus*. Lynch and Duellman (1997) listed *E. barlagnei* as possessing the "C" toe condition of *Eleutherodactylus*, meaning that its fifth toe is much longer than the third.

Eleutherodactylus barlagnei appears in the faunal and systematic lists of Bénito-Espinal (1990), Powell et al. (1996), Glaw et al. (1998), Censky and Kaiser (1999), Malhotra and Thorpe (1999), and Grouard (2001).

• **ETYMOLOGY.** The species name is a patronym for Patrice Barlagne, son of the resident forest officer (Lazell 1976) who collected the majority of the specimens and aided James Lazell in collecting on the Soufrière-Sans Toucher massif of La Guadeloupe (Lynch 1965).

• **COMMENT.** *Eleutherodactylus barlagnei* is currently (May 2002) listed on several websites as a species of conservation and legislative concern. A search for *E. barlagnei* on the search engine Google.com returned 15 websites.

LITERATURE CITED

Bénito-Espinal, E. 1990. Grande Encyclopédie de la Caraïbe. Tome 4. Sanoli, Pointe à Pitre, Guadeloupe.

Breuil, M. 2001. Amphibiens des Antilles: l'Hylode de Barlagne. Gwadloup Natures 8:29.

—. 2002. Histoire Naturelle des Amphibiens et des Reptiles Terrestres de l'Archipel Guadeloupéen. Guadeloupe, Saint-Martin, Saint-Barthélemy. Patrimoines Naturels 54:1–339.

Censky, E. and H. Kaiser. 1999. The Lesser Antillean fauna, p. 181–221. *In* B.I. Crother (ed.), Caribbean Amphibians and Reptile*s*. Academic Press, San Diego, California.

Frost, D.R. (ed.). 1985. Amphibian Species of the World: A Taxonomic and Geographical Reference. Allen Press and the Association of Systematics Collections, Lawrence, Kansas.

Glaw, F., J. Köhler, R. Hofrichter, and A. Dubois. 1998. Systematik der Amphibien: Liste der rezenten Familien, Gattungen und Arten, p. 252–258. *In* R. Hofrichter (ed.), Amphibien. Naturbuch Verlag, Augsburg, Germany.

Grouard, S. 2001. Subsistance, Systèmes, Techniques et Gestions Territoriales en MilieuInsulaire Antillais Précolombien – Exploitation des Vertébrés et des Crustacés aux Époques Saladoïdes et Troumassoïdes de Guadeloupe (400 av. J.-C. à 1500 ap. J.-C.). 3 vols. Unpubl. Ph.D. thesis, M.N.H.N., Paris.

Hardy, J.D., Jr. 1984. Frogs, egg teeth, and evolution: preliminary comments on egg teeth in the genus *Eleutherodactylus*. Bulletin of the Maryland Herpetological Society 20:1–11.

—. 1985. Frog mountain: preliminary comments on the genus *Eleutherodactylus* on the island of Guadeloupe, West Indies. Bulletin of the Maryland Herpetological Society 21:27–33.

Hedges, S.B. 1989. Evolution and biogeography of West Indian frogs of the genus *Eleutherodactylus*: slow-evolving loci and the major groups, p. 305–370. *In* C.A. Woods (ed.), Biogeography of the West Indies: Past, Present, and Future. Sandhill Crane Press, Gainesville, Florida.

—. 1999. Distribution patterns of amphibians in the West Indies, p. 211–254. *In* W.E. Duellman (ed.), Patterns of Distribution of Amphibians: A Global Perspective. John Hopkins Univ. Press, Baltimore, Maryland.

— and Thomas, R. 1989. Supplement to West Indian amphibians and reptiles: a check-list. Milwaukee Public Museum, Contributions in Biology and Geology (77):1–11.

Kaiser, H. 1995. Caribbean frogs: How molecules and genes help to resolve questions of their systematics, evolution, and biogeography. Futura 2: 88–95.

—. 1996. Systematics and biogeography of Eastern Caribbean *Eleutherodactylus* (Anura: Leptodactylidae): consensus from a multidisciplianary approach, p. 129–140. *In* R. Powell and R. W. Henderson (eds.), Contributions to West Indian Herpetology: A Tribute to Albert Schwartz. Society for the Study of Amphibians and Reptiles, Ithaca, New York.

—. 1997. Origins and introductions of the Caribbean frog, *Eleutherodactylus johnstonei* (Leptodactylidae): management and conservation concerns. Biodiversity and Conservation 6:1391–1407.

— and R.W. Henderson. 1994. The conservation status of Lesser Antillean Frogs. Herpetological Natural History 2:41–56.

—, D.M. Green, and M. Schmid. 1994a. Systematics and biogeography of Eastern Caribbean frogs (Leptodactylidae: *Eleutherodactylus)*, with the description of a new species from Dominica. Canadian Journal of Zoology 72:2217–2237.

—, T.F. Sharbel, and D.M. Green. 1994b. Systematic and biogeography of Eastern Caribbean *Eleutherodactylus* (Anura: Leptodactylidae): evidence from allozymes. Amphibia-Reptilia 15:375–394.

Lazell, J.D. 1976. This Broken Archipelago: Cape Cod and the Islands, Amphibians and Reptiles. Crown Publishing Group, New York.
Lescure, J. 1987. Le peuplement en reptiles et amphibiens des Petites Antilles. Bulletin de la Société Zoologique de la France 112:327–342.
Lynch, J.D. 1965. A new species of *Eleutherodactylus* from Guadeloupe, West Indies. Breviora (220):1–7.
— and W.E. Duellman. 1997. Frogs of the genus *Eleutherodactylus* in Western Ecuador. University of Kansas Museum of Natural History, Special Publications (23):1–236.
Malhotra, A. and R.S. Thorpe. 1999. Reptiles and Amphibians of the Eastern Caribbean. Macmillan Education Ltd., London, United Kingdom.
Powell, R., R.W. Henderson, K. Adler, and H.A. Dundee. 1996. An annotated checklist of West Indian amphibians and reptiles, p. 51–93. *In* R. Powell and R.W. Henderson (eds.), Contributions to West Indian Herpetology: A Tribute to Albert Schwartz. Society for the Study of Amphibians and Reptiles, Ithaca, New York.
Schwartz, A. 1967. Frogs of the genus *Eleutherodactylus* in the Lesser Antilles. Studies on the Fauna of Curaçao and other Caribbean Islands 24:1–62.
—. 1969. The Antillean *Eleutherodactylus* of the *auriculatus* group. Studies on the Fauna of Curaçao and other Caribbean Islands 30:99–115.
— and R. Thomas. 1975. A check-list of West Indian amphibians and reptiles. Carnegie Museum of Natural History, Special Publications (1):1–216.
— and R.W. Henderson. 1985. A Guide to the Identification of the Amphibians and Reptiles of the West Indies Exclusive of Hispaniola. Milwaukee Public Museum, Milwaukee, Wisconsin.
— and —. 1988. West Indian amphibians and reptiles: a check-list. Milwaukee Public Museum, Special Publications (74):1–264.
— and —. 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. University of Florida Press, Gainesville, Florida.

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